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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/685,857	10/11/2000	Frank Kowalewski	10191/1575	4655
26646	7590	11/28/2003	EXAMINER VARTANIAN, HARRY	
KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004			ART UNIT	PAPER NUMBER

2634

DATE MAILED: 11/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/685,857

Applicant(s)

KOWALEWSKI ET AL.

Examiner

Harry Vartanian

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Detailed Action

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgoshi(US Patent #5,666,352) et al in view of Yamamoto(US Patent #6,252,914). Regarding Claims 1 and 4, Ohgoshi discloses "A mobile station of a code division multiple access mobile communication system for transmission by carrying out quadrature multiplexing of a pilot signal and a data signal...includes a despreading circuit for generating phase error signals...by despreading the quadrature multiplexed reception signals...accumulators for converting the transmission rate of the phase error signals and the data signal group into the symbol rate, an averaging circuit for generating phase correction signals from the phase error signals of the symbol rate, and a phase correction circuit for generating data signal(I, Q) with the phase shifts being removed therefrom, by correcting the data signal group by the phase correction signals."(Abstract) Regarding the limitation of phase mapping, Ohgoshi et al discloses in fig 10b a diagram mapping the reception of two symbols with different phases. Regarding the limitation of averaging the error, Ohgoshi et al teaches "The averaging circuit 23 averages the phase error signals ($\Delta\cos(\varphi)$, $\Delta\sin(\varphi)$)²² outputted from the despreading circuit 21 for a period of a plurality of chips, and generates phase correction signals ($\Delta\cos(\varphi)$, $\Delta\sin(\varphi)$)²⁴ with noises being eliminated."(Column 3, lines 60-64)

Moreover, regarding the limitations in Claim 1 and 4 of multiplying the received signal by the correction factor "In the phase correction circuit 30, for example as shown in FIG. 6, the I' and Q' components of delay data 29 outputted from the delay circuit 28 are multiplied respectively by the correction signals 24 of $\cos(\phi)$ and $\sin(\phi)$ by multipliers 301A, 301B, 302A, and 302B, and addition and subtraction are performed by an adder 303A and a subtractor 303B to correct the errors of the received data signal values caused by the phase shift. In this manner, the data despreading circuit 32 can demodulate received data signals (I, Q) 35."(Column 4, lines 35-43)

Ohgoshi fails to teach the predistortion of the transmitted signal by the base station. However, Yamamoto discloses "radio communication system for reducing deterioration of the transmission quality due to multipath fading while downsizing a terminal and reducing the power consumption. The propagation characteristic of a propagation path 3 is estimated by an automatic equalizer 30 set in a base station 1, and the inverse characteristic of the propagation path is added to the down-transmission data to be transmitted to a terminal 2 in a predistortion section 50 in accordance with the estimation result, and the data to which the inverse characteristic of the propagation path 3 is added is transmitted to the terminal 2 through the propagation path 3 as transmission data."(Abstract) Therefor it would have been obvious to those skilled in the art at the time the invention was made to use signal predistortion in Ohgoshi communication system. The motivation to combine, is that it does reduce the need for expensive circuitry and high power consumption in the mobile unit.

Regarding Claims 2 and 5, Ohgoshi discloses the use of "A pilot signal despreading circuit 21 despreads the reception signals 1 by using spreading codes 26 for pilot symbol, and generates phase error signals(.DELTA.cos.phi., .DELTA.sin.phi.) 22 changing with a phase shift angle. An averaging circuit 23 averages the phase error signals..."(Column 2

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Lines 53-57) The applicant discloses in the second equation on page 8 that taking the conjugate and scaling the average error is approximately equal to the phase shift or difference in calculating the correction factor. Although Ohgoshi does not specifically disclose taking the conjugate and scaling, he does mention calculating a phase shift to be used to correct any phase offset that may have occurred during transmission (please see above paragraphs). This correction is made by multiplying the correction signal by the received signal (Column 4, lines 35-43). Therefore, the inferred method disclosed by the applicant is in fact disclosed by Ohgoshi.

2. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohgoshi (US Patent #5,666,352) et al in view of Rakib et al (US Patent #6,356,555). Ohgoshi meets all the limitations of Claims 3 and 6 except the use of QAM in his communication system.

However, Rakib discloses the use of QAM in his wireless communication system. More specifically, Rakib discloses "each remote unit, after frame synchronization has been achieved by that remote unit, modulating the n elements of each said inphase and quadrature result vectors onto two radio frequency carriers of the same frequency but offset in phase by 90 degrees using QAM modulation, said radio frequency carriers being synchronized in frequency to a master carrier in said central unit." (Claim 6) Therefore it would have been obvious to those skilled in the art at the time the invention was made to use QAM in Ohgoshi communication system. The motivation to combine is that in comparison to QPSK, QAM results in higher throughput when more than 4 points are used in a constellation.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Vartanian whose telephone number is 703.305.8698. The examiner can normally be reached on 9-5:30 Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703.305.4714. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is NONE.

Harry Vartanian
Examiner
Art Unit 2634

HV



STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
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